SARVA SHIKSHA ABHIYAN

AN ENVIRONMENTAL ASSESSMENT

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I. INTRODUCTION

Sarva Shiksha Abhiyan (SSA) is the flagship programme of Government of India to achieve Universal Elementary Education (UEE) in the country in a mission mode.

SSA covers 193 million children, 3.3 million teachers and nearly 1 million schools and alternative schools spread over 1.1 million habitations in 28 States and 7 Union Territories. The largest programme of its kind in the world, SSA is an integrated, comprehensive scheme in partnership with State Governments, Local Self Governments, the community and the civil society.

SSA is an effort to universalize elementary education by community ownership of the school system. It emphasizes on the active involvement of local self governments and grassroots level structures like Village Education Committee, Parent-Teacher Association, Mother-Teacher Association etc.

Goals

Sarva Shiksha Abhiyan aims to provide useful and relevant elementary education for all children in the 6 to 14 age group (grade I to VIII) by 2010. The objectives of SSA are:

- All children in school, education guarantee centre, alternative school & back to school camp by 2005
- Bridge all gender and social category gaps at primary stage by 2007 and at elementary education stage by 2010
- Universal retention by 2010 and
- Focus on elementary education of satisfactory quality.

Broad Strategies

The broad strategies of SSA are:

- Institutional reforms in the states to improve efficiency of the deliver)\`system
- Sustainable financing in partnership with the states (9th Plan - 85:15, 10th Plan - 75:25, 50:50 thereafter)
- Community ownership of school based interventions through effective decentralization
- Institutional capacity building for improvement in quality
- Community based monitoring with full transparency in all aspects of implementation
- Community based approach to planning with habitation as a unit of planning
- Special focus on girls, scheduled caste (SC) /scheduled tribes (ST), minority children, working children, urban deprived children, children with special needs, children in marginalized families and children in hardest to reach groups
- Thrust on quality and making education relevant
- Recognition of the critical role of the teacher and focus on the human resource development needs of teachers
- Preparation of District Elementary Education Plans reflecting all governmental and non-governmental investments
Interventions and components

Keeping with the above objectives, the major components of the programme are:

1. Opening of new schools, Education Guarantee Scheme (EGS) Centres and alternative and innovative education centers
2. Appointment of teachers and Para teachers
3. Provision of Grants - teachers grant, school grant, maintenance grant, Teaching -Learning Equipment grant.
4. Teachers training - in service and induction training
5. Setting up academic support structures (block resource centers and cluster resource centers) - appointment of resource teachers, contingency, TLM grants, TA/DA, library grants etc.
6. Free text books for girls and SC/ST children
7. Training of community leaders
8. Innovative activities in computer education, ECCE, girls education and education of SC/ST.
9. Integrated Education of the disabled
10. Provision for research, evaluation, supervision and monitoring
11. Civil works - construction of school buildings for new, building less and dilapidated schools, construction of additional rooms in primary and upper primary schools, construction of BRC and CRC centers, major repairs, provision of toilets, drinking water, electrification and boundary walls to schools.

Launched in 2000-01, the programme is now in its 6th year of effective implementation. All the 35 States and Union Territories of the country are presently covered. So far about 100,788 new schools and 10.12 lakh posts of teachers have been sanctioned under the scheme. SSA has also sanctioned construction of 125,918 new primary school buildings, 57543 upper primary schools, 692,678 additional classrooms, 27,028 resource centers, 235,041 toilets and 170,267 drinking water facilities.

The GOI has analysed the infrastructure gap which comes around 7 lakh classrooms, 16000 drinking water facilities and about 2,16,000 toilets on the basis of DISE data 2005-06 after factoring into the approvals given for 2005-06 and 2006-07 for SSA and achievements under TSC and ARWSP schemes during 2005-06 and 2006-07.
II. ENVIRONMENTAL ASSESSMENT - CONTEXT

In SSA environment issues are mainly related to civil works and efforts has been made to incorporate all needed aspects in planning and implementation process so that they can take care of environmental issues.

Manuals and guidelines have been circulated to all implementing states/ UTs to guide the activities under the programme. All the manuals and documents developed at the National level under DPEP has also been adopted under SSA to guide the construction component of the programme. The programme is being implemented through the State and District level Implementation Societies, set up at every state. Due to the decentralized nature of the programme, most of the decisions with regard to design and implementation of the programme are taken at the state and district level. The role of the Central Government (MHRD) is mainly advisory in nature, supporting and advising states on the proper implementation of the programme.

The SSA has inbuilt provisions to mitigate environmental issues, which can be ascertained from ‘SSA - Framework for implementation’ along with following documents.

3. Building Rural Primary Schools - Towards improved designs: DPEP publication, 1999
5. Manual on Planning and Appraisal 2005
7. Various guidelines / instructions issued to address environmental issues

The salient feature of SSA is the involvement of the community in every aspect of programme implementation. The local community is the best judge for the environment of a place. They have detailed information about the local microclimate, local building materials, local technologies etc. They are also aware of the remedial measures to be taken (which are in many cases traditionally followed) to avoid possible environmental fallouts. **Involving the community in planning and construction therefore ensures that the implementation is free from potential environment hazards.** Further, by promoting community participation, environmental benefits potentially go beyond the programme, as there are opportunities for building local capacities on environmental management, use of appropriate technologies, designs etc. in other similar works.
III. ENVIRONMENTAL ISSUES/ IMPACTS

1. SITE LOCATION AND SENSITIVITY

SSA provides for a primary schooling facility within 1 Km. of a habitation and an upper primary school in such a manner as to have 1 upper primary school for 2 primary schools but within walking distance of 3 km. In small habitations, where there have at least 15 children in the age group of 6-14 years, an EGS centre is established. Even for a habitation of smaller number of children, an AIE centre can be opened. The SSA also allows special interventions for out of school children in served habitations - bridge courses (residential or non residential) or a back-to-school camps can be organized for them before being mainstreamed into formal schools.

School buildings are provided under SSA only in case of formal schools. Buildings are provided for new schools, existing building-less schools and dilapidated schools. For all the other forms of schooling facilities (EGS and AIE variety), the community is expected to arrange for the physical infrastructure - it is mostly an unutilized existing building in the village or a spare room in a house. In cases where such a space is not available, the community might organize a temporary/ semi permanent structure made of locally available materials.

In case where a permanent structure of school building is constructed, it is always on public land or on a land donated by the community. The land may be owned by an individual member of the community or may be a Panchayat land. In both cases the land is transferred in the name of the schools before any construction activity is taken up. Since a participatory process is adopted, involving the whole village, there are no chances of people being displaced due to the construction of the school building.

<table>
<thead>
<tr>
<th>How to choose a site for a new school building?</th>
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<tbody>
<tr>
<td>• It should be within 1 km of the settlement</td>
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<tr>
<td>• It should not be located in any particular community’s area</td>
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<td>• The area of the site should ideally be of 1 acre, in no case should it be less than 1000 sqm.</td>
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<td>• It should preferably be of a regular shape</td>
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<td>• The site should not be in a low-lying area or in an area of heavy slope.</td>
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<tr>
<td>• The building should not be located infilled up soil or in soil with decomposed plant/ animal material</td>
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<tr>
<td>• Water should be available on or near the site. It should preferably have access to electricity.</td>
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<tr>
<td>• It should not be located near hazardous area or sources of noise like highways, rail tracks, factories etc.</td>
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</table>

Excerpts from ‘Let’s work together – a community construction Manual’ – DPEP

As the land is donated by the community, it is usually a good piece of land in or near the village and free from any environment hazards. The construction manual is issued to the community before the start of construction, also lists out the various environmental parameters to be considered for proper selection of land. Further, an approval of the engineer/ technical person supervising the construction is also taken by the community before finalization of the site. Almost all States have developed a community construction Manual, which is a key document to help and give to community members during execution of civil works. Normally school sites would be located in areas already approved for such purposes.
There could be a few schools to be located in a forest or any other protected areas (such as the coastal zone /forest areas) if such cases arise, site specific clearance is taken before execution of civil works.

Apart from new school buildings, the other major components of construction include additional classrooms and Resource centers (BRC and CRC). Additional classrooms and CRC buildings are constructed in existing school campus - they are usually placed in alignment with the existing school building, retaining the architectural features of the old building. The BRC is usually located in land belonging to the Education dept. or the Panchayat. In many cases it is located within the Panchayat complex or school compound.

Environmental issues are taken into consideration while constructing school buildings in areas where the entire region is vulnerable to natural hazards – e.g. riverine areas is Assam (prone to flooding), coastal areas of Orissa (prone to cyclone) and regions falling under the seismic zone V. The schools in the riverine areas of Assam have been designed as partially prefabricated structures that can be dismantled and shifted to a new location when the river changes the course or inundates areas.

School Building in the Riverine Area of Assam

Schools in the coastal areas of Orissa have been designed to double up as shelters during flood. Design of all buildings, both schools and resource centers, in the seismic areas of Gujarat, North Bihar and Uttarakhand incorporate all the remedial measures recommended in the IS Codes. Although a large number of buildings were destroyed or damaged in the devastating earthquake in Gujarat in 2001, not a single building constructed under DPEP suffered any major damage.

Location issues are more pronounced in the urban areas where there usually is a scarcity of land. Many schools in urban areas therefore run from rented buildings. Schools in the slum areas are usually located within the slum - most Slum improvement programmes have space set aside for school buildings. In cases where the slum is not an organized one, EGS/AIE centers are opened in a space provided by the community. All construction in urban areas, including their location, covered area and facilities provided are governed by the respective Municipal Bylaws.
The problems do occur particularly in urban areas, densely populated areas, slums and where the land is not earmarked or not available for schools. As per appraisal manual there is no provision for providing/purchasing land under norms of SSA and in such cases, the land is arranged either by the beneficiaries or by the State from their own resources. Such problems are tackled by the State according to State perspective and situation arising there in. Bihar State was encountering the problem of getting land in most of their urban areas. The State has now provided budget for purchasing land and providing it for SSA schools. The State is also coming forward and requesting industrialists, others to donate land for this noble cause. State like Andhra Pradesh are constructing multi-storied buildings in Metros by combining a few school together.

**Multi-storey Buildings in Andhra Pradesh**

In Andhra Pradesh several schools were running in rented/rent free buildings/community halls/temple verandahs in urban areas. These buildings were in dilapidated conditions and required dismantling and new school buildings construction. The surrounding of these buildings were also unhygienic. The non-availability of land and very high cost was major hurdle to construct school building to these schools. Therefore, the State decided to club 3-4 neighborhood schools and construct a multi-storey complex to house all the children of neighborhood schools in that building. The State has taken special dispensation from the State Government and Govt. of India to allow construction of such buildings by NGOs experts in such work. 33 such buildings were constructed in twin city of Hyderabad by Naandi Foundation and Round Table. This was a very effective solution for providing a innovative design with neat and clean environment to the children.

The environmental issues with regard to location of the newly constructed school buildings and other facilities are therefore addressed programmatically through the process of guiding the local community on site selection and ensuring technical approval of the same.

**An ideally located school building**

2. **SITE PLANNING AND BUILDING DESIGNS**

Department of School Education & Literacy has already issued a manual on ‘Building Rural Primary Schools - Towards Improved Designs’ for providing innovative and context specific design of schools. Moreover, the States having engineering cell in position which are designing the school buildings in accordance with National Building Code and taking into consideration the requirement of school buildings as per IS 8827-1978. Some States are also engaging Consultants/Architects to design school buildings. All new buildings under SSA are now being designed as composite structures with drinking water, toilet, kitchen shed, garden and play grounds.
The State has been directed to incorporate earthquake/cyclone resistant features in the school building design. The process of incorporating these features have increased after the earthquake in Bhuj (Gujarat), Tangdhar and Uri areas in J&K. The State of Gujarat has acquired sufficient expertise in the providing seismic design features in school buildings. The State of UP, Himachal Pradesh and Uttarakhand has also developed and constructed school building designs sensitive to seismic zone. The States falling in sensitive seismic zones III, IV and V are increasingly using the seismic requirement provisions while designing the school building. The various IS codes relevant for these designs are:

- IS 1893 (Part 1 - 2002) - Criteria for earthquake resistant design of structure.
- IS 4326 - 1993 - Practice for earthquake resistant design and construction of building.
- IS 13828 - 1993 - Guidelines for improving earthquake resistant of low strength masonry building
- IS 13920 - 1993 - Ductile detailing of reinforce concrete structure subject to seismic force.

The cyclone resistant designs are quite popular in costal districts of Orissa and Andhra Pradesh. After the fire incident in Kumbhakonan in Tamil Nadu most of States have replaced the thatched roofs. The States have been directed to replace thatched roofs of classrooms and kitchen sheds to concrete roof to avoid fire hazards. The States are now increasingly referring to IS 8827- 1978 and IS 2406 - 1963 which deals with requirement of school building safety precautions. The Department of School Education & Literacy had issued instructions to all the States/ UTs to observe following precautionary steps to avoid fire hazards in schools.

### Instructions issued by GOI on 27th July 2004 for school safety

#### Teachers:
- All teachers need to be sensitized to their responsibility for the safety and well-being of their students during school hours, and curricular/co-curricular activities. They also need to be equipped with adequate knowledge and wherewithal to protect their students in the events of emergencies.

#### School Buildings:
- They should be free from inflammable and toxic materials. If storage of some inflammable material (e.g. Fuel for cooking mid-day meal) is inevitable, they should be stored safely.
- The school should have adequate emergency exists.
- There should be adequate supply of water and sand for fire fighting purpose.
- School should have adequate supply of potable drinking water, with appropriate chlorination whenever necessary.

#### Mid-day Meal:
- Storage of food grains, and cooking and serving of meals should be done with strict regard to hygiene
- Cooked meal should be tested by adults sufficiently prior to being served to children so that contamination, if any, is detected in time and also

To observe 16th July of every year as "School Health and safety Day"
The States have also been made aware of the Disaster Management System by taking technical support from National Disaster Management Division of Ministry of Home Affairs and UNDP. In this regard a national workshop was held on 2nd February 2007 in which the issues of school safety was elaborately discussed with representatives of all the States/UTs and the minutes were circulated to all States/ UTs for compliance. The States like Bihar, Uttar Pradesh, Meghalaya and Assam have already started incorporating school safety measures in their building design in consultation with Disaster Management Division of Ministry of Home Affairs.

3. **LEARNING ENVIRONMENT FREE OF BARRIERS**

The *Sarva Shiksha Abhiyan* aims to provide a learning environment free from all barriers - both social and physical. Equity issues have been built into all aspects of the programme.

Inclusive Education is one of the major components under SSA with a separate financial allocation. The primary concept behind creating a barrier free physical environment is to sensitize the management to the need of children with special need in designing the school buildings. This requires incorporation of additional features in new buildings and modifications to existing buildings, in accordance with the provisions of IS 4963 (1987) and IS 4838 Part I (1969)

The States are apprised regularly in the quarterly meetings to create a barrier free physical environment in the school on following lines.

**Children with loco-motor impairment**

Includes children with non ambulatory and semi ambulatory disabilities

- Gates, approach road and steps to allow for smooth movement.
- Ramps with handrails to be provided.
- No major level differences within building. Reduce passages and corridors.
- Toilets to be provided with adjustable seat, grab rail and ramp.

**Children with visual impairment**

Includes children with low vision and total blindness

- Plan of the building should be simple
- Design of windows and illumination levels to eliminate glare
- Reduce distance between the child and the chalk board
- Use of contrasting colours and textures to aid identification of levels, ramps, passageways, steps, doors etc.
- Minimize risk of injuries - avoid projections, sharp edges etc.
- Provision of embossed eye charts on walls

**Children with hearing impairment**

Children with hearing deficiency or have difficulty in comprehending words and sounds in noisy environments.
• Reduce distance between teacher and child
• Insulate walls – provision of low cost mats and panels, soft board, charts, etc.
• Provision of supplementary visual information – ideograms

Children with intellectual impairment
Children with uncommon social behavior or hyperactive

• Provide for lot of open space and greenery
• The school design to allow the teacher to be able to pay personal attention to the child
• Create / in built personal space for the child
• Use of bright colours
• Provision of in built play elements

States are now embarking on providing ramps with railing not only for classrooms but also for toilet facilities to have easy access for the CWSN. States have so far constructed about 502,165 ramps. The Ministry has developed a booklet called 'Building Rural Primary Schools' and 'Child Friendly Elements for Rural Primary Schools' in which specification for construction of ramps is provided i.e. 1:12. This specification has been regularly emphasized in the quarterly review meetings.

4. ENERGY EFFICIENT & ENVIRONMENT FRIENDLY BUILDING DESIGN AND CONSTRUCTION

SSA encourages Environment friendly and Energy efficient buildings so that these buildings should consume less energy in winter & summer. To ensure this States constructed buildings with cross-ventilation, proper orientation and placement of building in such a way that it ensure maximum energy saving and comforts to the children in summer and in winter. Some States are also constructing rattrap bond in walling, which are not only cost effective but also keep the environment inside building comfortable during cold and hot season.

Solar passive features have been incorporated in buildings in Pongi & Spiti valley of Himachal Pradesh. This was shared with States/UTs in the National Level Cross-State Sharing Workshop held at Bhuj (Gujarat) in November 2005. The States particularly J&K, Arunachal Pradesh, Uttarakhand, Sikkim & other North Eastern States have now realized the
usefulness of Solar Passive Structures and have started planning building designs for energy efficient building in their States.

The Technical Support Group of SSA is also popularising very simple but effective techniques to make school buildings as energy efficient such as white washing/painting of a roof can easily reduce the transmission of heat during hot weather.

5. CONSTRUCTIONS RELATED ISSUES INCLUDING QUALITY CONTROL

Almost all constructions under SSA are being executed through the Village Education committees or other similar school level committees. Arrangement for materials is made by the community. The construction is either done by the villagers themselves or through contracted labour. The labour employed is invariably local, generating an employment opportunity. In case a labour contractor is employed, all relevant rules and regulations relating to construction labour are applicable, including the Minimum Wages Act. Often, the people from the village may voluntarily contribute labour. This practice is found common in most states as the villagers have a stake in the successful construction of the school building and education of their children. The provisions of the Minimum Wages Act or other Construction Regulations would not be applicable in such cases.

In case of larger constructions like BRCs, engagement of a separate construction agency is permissible. Such a construction agency may be a government department like the PWD (Tamil Nadu), the Zilla Parishad (Karnataka), the Jal Nigam (UP) or private contractors appointed by the Implementation Society. For, any government agency, it is mandatory to follow all existing norms and regulations with respect to Construction, construction labour and issue related to environment. In case a private contractor is appointed, it is based on a proper tendering process and the tender documents clearly specify the requirement of the contractor to abide by all relevant environmental and construction laws.

Quality of construction is a focus under SSA. The quality control is achieved through the following means

- All constructions are supervised by technical persons, who may be either from the government departments or recruited on contract. They are available at all vital stages of
construction and help the VEC in the identification and purchase of good quality material for construction.

- All involved in the construction process are provided extensive training. This includes engineers and supervisors, the VEC (including the teacher) and the local masons who would be used for construction. Additionally the VEC is also supported by a detailed construction manual that include the drawings, the technical details, the estimate, the accounting procedures and broad tips for construction. The VEC training programmes and the construction manual also address to basic site management issues such as:
  
  o Reducing wastage of materials at site
  o Ensuring safety in the area surrounding the construction so that no hurt or injury is caused to people during the construction process
  o As far as possible, avoiding damage to the existing flora and fauna.
  o Restricting air and noise pollution to a minimum and
  o Ensuring proper time and lost management

- States have also been advised to conduct laboratory and field tests of the construction quality at regular intervals. This can either be done through the regular engineering setup or through an external agency. Purchase of necessary equipments for the same is allowed under SSA.

**Local material and cost effective technologies:**

As per the SSA framework, the programme “will encourage use of local construction materials and low cost technologies”. This is based on the earlier experiences of Lok Jumbish, BEP and DPEP and the extensive resource mapping exercise taken up under such programmes identifying local materials.

India has a number of building materials like stone (sandstone, slate, granite, laterite), bamboo, tiles, timber etc. available in abundance in various parts of the country. Use of such locally available material not only reduces the cost of the building but also reduces the energy consumption of buildings. Materials like burnt bricks and cement concrete are much more energy intensive. Local materials have been put to excellent use in the school buildings of Rajasthan, Himachal Pradesh, Assam and other states under DPEP. The same practice is being encouraged under SSA. Use of potentially hazardous materials like Asbestos is consciously avoided and efforts are made to choose materials that cause a minimum depletion to the natural resources.

Use of alternate technologies like rat trap bond wall, filler slab roof and stub foundations have been tried out previously under BEP and DPEP. The primary advantage of such technologies is the reduction in the consumption of cement and steel, which are highly energy intensive. Apart from the already tested technologies, SSA would also promote various other alternatives like stabilized mud block, fly ash bricks, brick corbelled structures, jack arch roof etc. The Technical Support Group of SSA is in contact with other National Resource Institutions like HUDCO and CBRI for this purpose.

The primary consideration for the adoption of such alternate materials and technologies would be the maintainability, replicability and durability of such structures. Cost effectiveness, rather than cost reduction, would be the principle behind such initiatives.
Most of the States are using these cost effective technologies with use of local materials to make the building environment friendly. In Uttarakhand, the State is using CC Block for walling from the locally available sand & gravel. Similarly, the State of Andhra Pradesh, Madhya Pradesh, Himachal Pradesh, Rajasthan, etc are using stones in super structure. In Rajasthan and Madhya Pradesh use of stones slabs in roofing is very popular. In Assam and other Northern States are using bamboocrete walling. Kerala and other coastal States are also using tiles in roofing. The State of Arunachal Pradesh, Chhattisgarh, and Rajasthan also used pre-fabricated bamboo structures. The GOI is also advising the States to discourage use of non-biodegradable materials such as pre-fabricated building of PVC etc.

### 6. TEACHING LEARNING ENVIRONMENT

Creating a conducive learning environment, building on experiences of children, contextualising learning are some important environment related features of pedagogical renewal initiated in the States. These features are found not only in textbooks and TLMs but also in trainings, resource support that is extended to teachers, evaluation strategies and so on.
Teaching Learning Materials (TLM):

Sarva Shiksha Abhiyan provides every teacher with an yearly grant of Rs. 500 for developing teaching learning materials. Manx- stales have conducted separate training and workshops for teachers on development of TLM. The emphasis is on developing TLM that are local, relevant and lead to better learning outcomes. Clay balls, twigs, leaves etc. have for long been used as teaching learning materials in rural schools. Such materials, apart from being low cost, are also easy for the children to identify with.

Besides, every school is also provided a yearly grant of Rs. 2,000 for the development of the school. Various kinds of aids and appliances like games and music kit can be procured from this grant. The money can also be used for buying charts, posters etc or for painting, graphics or murals on the walls as visuals are often a much stronger medium of instruction than written documents.

Most schools in Gujarat have 'bal mitra varg' painted on the walls of the lower classes.

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<tr>
<th>A Learning Corner</th>
<th>Painting on wall – visual method</th>
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<tbody>
<tr>
<td><img src="image1.jpg" alt="A Learning Corner" /></td>
<td><img src="image2.jpg" alt="Painting on wall – visual method" /></td>
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</table>

Textbooks and teaching learning materials promote a learning environment free from fear and authority consciously building in elements of peer and group learning using local materials. For instance, the lesson 3 in class 2 mathematics books in Uttar Pradesh has an exercise with pebbles and dice that demands children to sit in groups and interact with each other while doing addition. Each child in this exercise has the freedom to select a number. Children will not only count and add but will also try and figure out how many pebbles are required to win. Each child will also keep a check on the pebbles picked by others in his group. The lesson thus in itself promotes peer and group learning.

In Tamilnadu activity based learning method has been introduced in Municipal Corporation Schools of Chennai where children learn through activities in a group of 4-5 children. The progress of learning level of children is assessed automatically in the process through a series of activities outlined in ‘cards' without having formal examination and test. The process is quite natural, spontaneous and free from pressure, which make learning as joyful to the children.
Even in mathematics textbooks, there is a shift from linearly arranged topics in form of exercises to a more open and interesting approach to teaching. Often stories, poems and games are used to introduce and build on concepts. Such features are clearly visible in textbooks of Kerala, Haryana, Uttar Pradesh and to some extent in Tamil Nadu.

**Physical Built Environment:**

Even the physical built environment is creatively used as learning aids. There are examples of window grills and floor patterns being used for teaching learning. A scale painted on the wall, a weighing machine, local games engraved in the floor, a sundial constructed in the campus - various interesting elements have been used as learning aids. Such elements need not be limited to the new schools. Existing schools can also be provided with such facilities with very little cost implications.

On the physical side, furniture, chalkboards, storage and display areas - all contribute to the teaching learning environment within the classroom. Chalkboards are provided not only to the teacher but also for the children. The children's chalkboards are usually made in various interesting shapes - this makes them attractive and encourages the children to use the board. All states have been advised to use green chalkboards instead of black. Storage and display spaces of various shapes and sizes also make the classroom lively and interesting.
Schools in rural parts of the country by and large do not have furniture. While there are instances of community donating furniture in some schools, most schools provide jute mats or durris for children to sit on. Most of the new school designs developed under DPEP and SSA also attempt to address furniture less situations by providing an in-built ledge along the walls of the classroom - this serves as a writing top and can double up as a display area when not in use. Some schools in Karnataka has attempted to have foldable wooden worktops which can be folded up when the classroom is required for some activity. Assam is experimenting with the use of bamboo furniture as an environment friendly option.

The exterior of the classroom, which includes the veranda or the school campus can also be used as an effective learning space. Learning in an open surrounding, under the trees can actually be 'fun'. There are examples of the veranda of a classroom being modified into an amphitheatre which also doubles up as an open air classroom. Free standing chalkboards under trees or along the boundary wall provide opportunities for outside learning - this is a Common sight in the schools of North India (UP, Haryana, Punjab, Gujarat) during winter.

As an attempt towards making the school more 'environment friendly', many schools have developed gardens within the school campus consisting of fruit trees, flowering shrubs and medicinal herbs. These gardens are tended and maintained by the students and the teachers, often with active support from the VECs. Many teachers can be seen to be creatively using these garden and the trees in their teaching transactions. SSA endeavours to create a lively learning environment in all the schools of the country - both new and existing. A handbook for such inexpensive child friendly elements has been developed under DPEP and has been circulated to all the states. All states have also been oriented to the importance of such elements in the transaction of pedagogy.
Several States have now started adopting 'Building as Learning Aid (BALA) elements in construction of school buildings. States like Gujarat, Karnataka, Delhi, J&K, Himachal Pradesh, and Madhya Pradesh have done extensive work to include BaLA features in their new school building. The other States are also now in process of following BALA in the school infrastructure. The BaLA concept is not only useful project building as learning aid but it also provides simple but effective use of space which we generally do not consider useful for school related activities. It is widely known that child friendly elements and BaLA are not only attracting the children in the School enrolment but helping in their retention and also helping Children to learn quickly.

Building as a Learning Aid (BaLA), aims at using the built elements like the floor, walls, pillars, staircases, windows, doors ceilings, fans, trees, flowers, or even rainwater falling on the building as learning aids. For example, a window security grill can be designed to help the children practice prewriting skills or understand fractions; a range of angles can be marked under a door shutter on the floor to explain the concept of angles; or ceiling fans can be painted with colour wheels for the children to enjoy ever-changing formations; moving shadows of a flag-pole to act like a sundial to understand different ways of measuring time; planting trees that shed their leaves in winters and are green in summers to make a comfortable outdoor learning space.

7. SAFE DRINKING WATER & SANITATION FACILITIES

Schools under SSA are envisaged as a composite unit comprising of adequate number of classrooms, open spaces, water supply and sanitation facilities, electricity and an enclosed boundary. However, due to budgetary constraints, it may not be possible to provide all the facilities to all schools in one go. Provision of drinking water and toilet facilities is therefore accorded a higher priority within the programme compared to electricity or playground.

SSA however, seeks convergence with various central and state level schemes and funds in an effort to improve the overall school environment and provide for all the necessary facilities. Central schemes like the Swajaldhara, Total Sanitation Campaign, PMGY, SJY, MP/ MLA LAD funds, Rajiv Gandhi Rural Electrification Scheme, 11th Finance Commission grants, State government, funds and various other Panchayat level funds are all to be tapped and converged with the SSA funds to provide all the necessary infrastructure facilities to the schools. Preparation of a complete infrastructure plan with respect to each school is proposed under SSA.

Drinking water is usually provided through the extension of an existing pipeline or by providing a hand pump. India Mark II/III systems are usually used for hand-pumps - these are easy to operate and maintain. Care is taken to locate the water facility in such a way that it does not create water-logging in the surrounding area. The water source usually has a platform surrounding it from which the water is drained out in a channel. In many cases, depending upon the initiative of the local community, this waste water is reused for flushing of toilets or for watering the plants.

There is a significant convergence with Rural Development and other related departments with respect to provision of water facilities. Technical expertise is sought from these departments to address problems with regard to water quality and water table. In areas where the water table is low, a deeper boring is required and consequently a higher unit cost. It has
been agreed in a meeting with the National Drinking Water Mission that such cases, where the unit cost is likely to be high, are to be taken up through the Swajaldrha scheme (which do not have a limit on the unit cost). The relatively easier cases would be met through the SSA funds. Directives to this effect have been sent to both the Rural Development and the Education department at the state level through the concerned line Ministries.

**Instructions issued by Ministry of Human Resource Development to ensure effective convergence in provision of drinking water facilities and toilets in schools with Department of Drinking Water & Supply on 27th January 2007**

- All State Project Directors of SSA should provide
  - Target dates for complete coverage of drinking water and toilet facilities.
  - Include a representative of Drinking Water Mission in the Executive Committee of SSA.
  - Form a small committee at the State level comprising officers from both the programme to coordinate planning for total coverage of toilets and drinking water facilities.
  - Form a similar committee at district level for planning and coordination.

**Rain water harvesting** techniques have been successfully demonstrated in school buildings of Rajasthan and Gujarat. This is now being expanded to the drier areas of other states like Maharashtra, Karnataka, Tamil Nadu and Andhra Pradesh under SSA.

**Rainwater Harvesting in Rajasthan**

Most part of Rajasthan fall in arid zone and it face lot of problem of water scarcity especially in schools during summer season. The main reason of scarcity of water is low average annual rainfall, consecutive occurrence of draught depletion of ground water level and over exploitation due to increasing population, agriculture and industrial use.

Rain water harvesting is a traditional practice in Rajasthan which is a simple, reliable and eco friendly technique to conserve water in a tank locally known as Tanka. Water from rain accumulated in school campus and terrace of the building can be taken to Tanka and conserve for future use. The harvested water could be used for drinking and preparation of Mid-day meal. A Tanka of 38.17 cum can serves the requirement of 100 children for a year.
Provision of toilet facilities has been found to have had a positive impact on retention of girl children, specially at the upper primary level. It is also a relief for the lady teachers and can be seen as an important intervention to encourage appointment of lady teachers in rural areas. Toilets are also necessary from the point of view of promotion of better hygiene practices among children.

Provision of toilets/ urinals have been a major component of the civil works interventions in earlier programmes as well as under SSA. At present, the aim is to provide sanitation and water facilities in all schools at a minimum level. Maximum requirement is being met by Department of Drinking Water Supply as per the prescribed norms. The toilet design is based on the Sulabh model of the twin pit system. Septic tanks are usually discouraged (except for cases where the water table is very low and there is a risk of contamination) from cost and maintenance considerations. In fact, maintenance has been a major concern with respect to toilets constructed in earlier programmes. States are now increasingly adding overhead storage tanks, force pumps for keeping regular flow of water in toilets. The States are now more conscious of keeping toilets hygienic and clean by providing ceramic tiles on walls and floors. SSA provides separate funds for maintenance of the school building and part of this fund is being utilized for the maintenance of toilets also.

<table>
<thead>
<tr>
<th>Water Supply Facilities</th>
<th>Toilet with Overhead Tank</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image of water supply facilities]</td>
<td>![Image of toilet with overhead tank]</td>
</tr>
</tbody>
</table>

As school buildings become more equipped, the need for a boundary is also being increasing felt. A boundary provides a sense of enclosure and the necessary security to the school. States have been advised to explore other convergent sources of funding for this purpose. However, in cases where a boundary wall has been identified as a priority (e.g. in Himachal Pradesh, where the terrain made it mandatory to have a boundary wall in certain cases) and convergent sources of funding were not available, construction of the same has been sanctioned under SSA.

States have also experimented with different types of boundaries. Boundary with bamboo fencing is a common feature in the schools of Assam and north West Bengal. Stone patties are used as boundary in the stone intensive areas of Madhya Pradesh and Andhra Pradesh while in the tribal areas of Bastar in Madhya Pradesh, boundary walls are made of mud and decorated with tribal paintings. In Gujarat, the school itself has been so designed that addition of a small jail wall encloses the whole school. In general, provision of hedges and green fencing as boundary is being encouraged as an environment-friendly option.
The environmental concerns with respect to school facilities like drinking water, toilets, boundary etc have therefore been identified and proactive steps have been taken to address them.

8. HEALTH AND HYGIENE OF CHILDREN

Health and hygiene forms an important part of school environment. Provision of water sanitary facilities to schools is a step towards promoting hygiene in general and during meals in particular. Many States have a system of maintaining health card for children through which growth and general health condition of the children are monitored. The States have included programme of health and hygiene in the school curriculum and is part of the classroom activities. The teachers are conscious of getting health checkup of children in their class frequently and maintaining health card. Taking children to hospital, interaction with doctors is become a part of school activities. Some States are running special programme to ensure hygienic environment in the schools. The important one are Swasthh in Karnataka, and Jharkhand and SSHE in Assam. In the school cabinet of Karnataka there is a separate Minister for Health. Schools of many other States have Safai Samitis comprising of children who are responsible for cleanliness of the school. Massage relating to health and sanitation issues are delivered in an interesting way to the children. The children, equipped with the knowledge has served as guiding agent in the village. The Education aspect of the programme provide an excellent opportunity to promote sanitation awareness with a popular theme of participation from teacher to child, child to child, child to parent, parents to parents, child and parent to community. The matter regarding health and hygiene of children is being persuaded through Quarterly Review Meeting and National Level Meeting. In the National Level Meeting held at Bhuj, Gujarat, the good practices of Swasthh in Karnataka was shared with the other States.

Implementation of Swasthh plus in Jharkhand

The State of Jharkhand started Swasthh plus programme in 2 districts i.e. East Singhbhum and Ranchi in 190 and 250 schools respectively. The focus of the programme is on providing sanitation infrastructure combined with broader agenda of hygiene that includes sanitation and healthy and education. The idea is that children want their schools to be clean healthy and safe. If school going adopt health, hygiene and sanitation practices their sibling are also
likely to follow their example.

The middle Durku in Potaka block of Singhbhum was typical Government school without proper drinking water facility, toilet without water, no compound wall and having 2 classrooms full of dusk and broken floors. Though the environment in 2003 was 120 the actual attendance use to be less than 50.

Gradually the schools took up the interventions of Swasthh plus in the areas of physical environment, school community linkage and active involvement of children through child cabinet. Funds for toilet (separate for boys & girls), drinking water, boundary wall and additional classrooms came from various sources like SSA, TSC, PHED and MLA fund. Along with close involvement of VEC members and children die funds were utilized to upgrade physical facilities which made school environment much friendlier for children specially girls. The immediate impact was that the attendance of children, especially girls started; increasing and by the beginning of 2005 all children of the village were in-fact; coming to this school. The private schools had to close down or shift to another village. In-fact for a visitor it will be difficult to believe that this is a Govt. school. The VEC chairman however gives equal credit to the software component of Swasthh plus programme which motivated teacher, children and community alike to create such a school. This is not the story of one school.

The programme of health hygiene of children is also being spread through community involvement and participation which is otherwise is the main plank of implementation of activities under SSA.

<table>
<thead>
<tr>
<th>Swasthh programme in Jharkhand</th>
<th>Hygienically Maintained School</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.jpg" alt="Image" /></td>
<td><img src="image2.jpg" alt="Image" /></td>
</tr>
</tbody>
</table>

9. TECHNICAL SUPPORT STAFF

SSA is a decentralized programme for Universalisation of Elementary Education for the children of the age 6-14 years. GOI has already issued broad guidelines to all the States and UTs for supervision, monitoring and management structure for implementation of Civil Works SSA is quite flexible in adopting context specific institutional arrangement. Some of the States have engaged technical personal either on contract basis or deputation from State Engineering Department. Some States are utilizing services of line engineering department of the Stare to implement civil works in SSA. Very few States have taken help from NGOs of repute to construct technically complicated buildings in urban areas. States are free to choose the supervision and monitoring mechanism for implementation of civil works within the SSA.
framework. GOI primarily monitor the implementation strategies, outcome and budgetary utilization. At school level VCC/VEC are implementing agencies, with the technical support and guidance from State/district/block level supervision system.

Generally, 2-3 senior level engineers are appointed at the State level depending on the size of the State. At district level 1 -2 middle level engineers are appointed who coordinate the works with the field level engineers and also the State level engineers. At block level there are 1 or 2 junior engineers depending on the workload.

Most of the States engaged technical personnel either on deputation or on contract basis to supervise and monitor civil works. However, there are some States which are taking help from line Department for executing SSA civil works. The most important among this category is Uttar Pradesh. The detail of post sanctioned and filled up is as below:

<table>
<thead>
<tr>
<th>State</th>
<th>State level</th>
<th>District level</th>
<th>Block level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sanctioned</td>
<td>Filled</td>
<td>Sanctioned</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>6</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Arunachal Pradesh</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Assam</td>
<td>6</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>Bihar</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Chhattisaghr</td>
<td>3</td>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td>Gujarat</td>
<td>18</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>Haryana</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Jharkhand</td>
<td>3</td>
<td>3</td>
<td>44</td>
</tr>
<tr>
<td>Karnataka</td>
<td>6</td>
<td>6</td>
<td>32</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>2</td>
<td>2</td>
<td>96</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Orissa</td>
<td>7</td>
<td>7</td>
<td>30</td>
</tr>
<tr>
<td>Punjab</td>
<td>2</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>3</td>
<td>3</td>
<td>64</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>4</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>Tripura</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>3</td>
<td>1</td>
<td>Rural Engineering Department</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>West Bengal</td>
<td>4</td>
<td>3</td>
<td>60</td>
</tr>
</tbody>
</table>

Generally a junior engineer at block level is handling on an average of 30-40 sites of construction pertaining to BRC/CRC, primary / upper primary school building and additional classrooms. For example in Orissa a junior engineer is handling an average 35 sites whereas in Gujarat it is handling only 27 sites. However, the junior engineer of the State which is having more infrastructure gaps is handling more sites than the average mentioned above.

10. **OPERATION AND MAINTENANCE**

Maintenance of created assets is also an essential component of the programme. Regular upkeep of the school environment is essential to prevent deterioration over time. Whitewashing and painting, roof and site drainage, maintenance of the water and sanitation
facilities, site cleanliness and greenery are a recurring requirement with respect to school buildings. SSA provides funds for maintenance up to Rs. 5,000 per year per school, which may be utilized up to Rs. 7,500 for school having classroom more than 3 and Rs. 4,500 for the school having up to 3 classrooms. While the requirement for small schools is usually much less, the larger schools may require additional funds to be generated through the community to meet all the maintenance requirements. A broad guideline for the utilization of this maintenance grant has been provided to the States.

The SSA has recently taken approval to provide funds for major repairs up to Rs. 150 crores per year for the schools not constructed within the past 10 years.

<table>
<thead>
<tr>
<th>The detailed guidelines for utilizing major repairs funds:</th>
</tr>
</thead>
<tbody>
<tr>
<td>① Rs 150 crore will be available per year for major repairs distributable proportionately among the States as per the number of schools.</td>
</tr>
<tr>
<td>② A district can propose up to a maximum of 5% of the existing schools in a year.</td>
</tr>
<tr>
<td>③ Schools constructed within the past 10 years will not be considered.</td>
</tr>
<tr>
<td>④ Cost of repair should not be more than 60% of the cost of new constructions.</td>
</tr>
<tr>
<td>⑤ District to provide list of schools to be repaired with photographs and cost estimate for repair.</td>
</tr>
<tr>
<td>⑥ State ensures sufficient delegation of power at the district level.</td>
</tr>
<tr>
<td>⑦ Onsite technical supervision by qualified personal.</td>
</tr>
</tbody>
</table>

Apart from that SSA emphasized needs for convergence with schemes implemented by other department of the same for repair of school buildings. A principal source of such funds are the non plan allocation of State funds on the repair and maintenance of schools - most states have substantial funds allocated under this Head. Funds allocated to States for relief operations are also allowed to be used for the repair and maintenance of school buildings and other infrastructure. Rajasthan has made effective utilization of the drought relief funds for meeting their maintenance requirements.

11. **TRAINING AND ORIENTATION**

SSA provides provision for training to technical personnel and community members under 'Management' and 'Community Mobilization Head'. The Ministry has instructed all States UTs to provide at least 5 days training to all technical personnel to acquaint them with basic concept of construction in SSA. The Govt. of India has developed a number of Manuals on construction activities which provide basic knowledge of implementation of civil works in the State under SSA. Beside that the States have also developed their own Manuals/guidelines especially for the Village Education Committees which are primarily responsible for implementation of civil work at the grass root level. These manuals/guidelines are providing onsite orientation to the engineers, communities, etc.
Govt. of India is regularly conducting quarterly meeting in which orientation on construction related aspects is given to the State engineers. Moreover, the cross State good practices are shared in these quarterly meetings. The States are also directed to send their personnel for exposure visits to other State to have an onsite feeling of good practices being implemented by host State. Recently, States were advised to visit Gujarat as a roll model State to review their management structure, good construction practices, community participation and particularly-Independent Third Part)’ Evaluation system. Gujarat has perfected the State of art of third party evaluation.

12. **BEST PRACTICES**

Most of States have developed best practices in various fields like best construction practices, management structure, third party evaluation system, rain water harvesting, rain water harvesting for recharging groundwater, BALA elements, composite designs, convergence for sanitation and water facilities, convergence for multi-storied building in urban areas, earthquake resistant designs, and implementation of health and hygiene programme *swasthh* etc. The details of these practices are included in the relevant section of the report.
13. CASE STUDIES

As mentioned under best practices, case studies have been done on most of the components mentioned above. The material is available with the TSG and has been presented before the JRM and discussed shared with States in Quarterly Review Meeting from time to time.

14. COMMUNITY CONSULTATIONS AND PUBLIC DISCLOSURE

The GOI has already passed the ‘Right to Information Act’, which provides for the mechanism to get information. Besides, MHRD has been displaying all information, related to project activities, on its website (www.education.nic.in). Moreover, community consultation is an integral part of the SSA program. The overall program is being planned as a participatory process where communities and local level institutions including the village education committees are involved in identification, planning, design, implementation, operation and maintenance of the schools and all other program activities. Consultations with school teachers, experts, NGOs and other stakeholders will continue throughout the implementation period.
IV. THIRD PARTY EVALUATION

Independent Third Party Evaluations (TPEs) are being conducted by States. The DSEL has also initiated National TPE.

State Level Independent Third Party Evaluation (ITPE) of Civil works: In order to improve the quality of civil works, States like Gujarat, Maharashtra, Karnataka, Rajasthan are earning out third party evaluation of civil works during constructions. They are also providing necessary guidance and resource support to the supervision staff and VECs. ITPE is also testing the material and technologies adopted by the construction agencies and apprising the State, district and field level personnel with the results of these tests. The State of Orissa, Uttarakhand, Jharkhand, Chhattisgarh, Punjab, J&K, Andhra Pradesh, Himachal Pradesh and Uttar Pradesh have initiated process for engaging independent 3rd party evaluation of civil works. The PAB has taken commitment from all major States to initiate process to engage ITPE to evaluate civil works.

Terms and Reference for Engaging Independent Third Party Evaluation by the State of Gujarat

The State of Gujarat is pioneer in engaging Independent Third Party Evaluation (ITPE) to assess the technical quality of construction works. The beauty of arrangement is that it assesses the quality of construction during execution of work, which provides space for taking corrective measures. The main TORs of engaging ITPE are follows:

① Minimum 5 visit for each activity.
② Mandatory visit at plinth level, casting of beam and slab and completion stage.
③ Appointment of one graduate engineer having 5 years experience.
④ Field and laboratory testing of construction material.
⑤ Additional weightage for capability of mobile testing laboratory.
⑥ Shall provide methodology for supervision.
⑦ Should write observations and suggestions in book available at site.
⑧ Verify that minimum 5 trees are planted by VCWC.
⑨ Highlight the problem area and suggest solution to achieve overall target of quality assurance.
⑩ Arrange 2 workshops with engineers for sharing experiences.

National Level Third Party Evaluation: The Ministry is earning out National Level Third Party’ Evaluation on civil works including environmental impact of eleven States. The work is entrusted to M/s Crux Consultant Pvt. Ltd. The States in which evaluation is going on are Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, J&K Tamil Nadu, Uttar Pradesh, Maharashtra and West Bengal. The evaluation covers following aspects.

- Evaluation of planning process
- Site selection process
- Construction process
- Cost effectiveness process
- Design innovation process
- Additional facilities
- Safety audit
• Implementation (School buildings/ SIEMET/ BRC)
• Community involvement and responses
• Provision for CWSN
• Operation and maintenance

The agency has completed its work in the State of Assam, Bihar, Chhattisgarh, Gujarat, Jammu & Kashmir, Madhya Pradesh and Tamil Nadu and submitted reports to Ministry. 75 schools each have been covered in each study State. A summary of key findings, based on quick reading of the seven State reports\(^1\), is presented in Annex-I. It is pertinent to mention that these are initial findings which are being confirmed with States.

\(^1\) Assam, Bihar, Chhattisgarh, Gujarat, Jammu and Kashmir, Madhya Pradesh and Tamil Nadu
V. STRATEGY TO MITIGATE ENVIRONMENTAL ISSUES

This assessment looks at the various support mechanisms that have been created within the design of the programme to help address environmental concerns during its implementation.

At the outset it needs to be clarified that SSA is a decentralized program and States are free to decide on implementation strategies within the Framework of the program. This is also natural given the huge diversity within states thereby making it impossible to have a uniform implementation strategy. GOI monitors the program primarily against the outcomes and budgetary utilization. But apart from monitoring, GOI also plays a supportive role, strengthening the capacity of the states and helping them develop the right kind of strategies and interventions.

Based on experience in DPEP and other basic education projects, GOI has already circulated the following documents/instructions to the states to guide program implementation.

- A sample community construction manual that lists issues relating to site selection and good construction practices.
- A guideline on design that lists issues relating to functionality of schools (i.e. illumination, ventilation etc), essential design requirements (storage, display, chalkboards etc) and basic facilities to be provided (toilets, hand pumps, boundary, ramp etc).
- A compilation of school designs developed under DPEP that give the basic requirements of a rural primary school.
- A handbook on child friendly features that can be incorporated in a school.
- A guideline for utilizing the Rs 5,000/- maintenance grants provided under SSA.
- An instruction to States to converge with Total Sanitation campaign, Swajaldhara and other Central/State schemes for providing water supply and sanitation facilities to all schools.
- A suggestive pattern of the various management structures that can be adopted to implement civil work activities.
- Manual on Financial Management & Procurement provide various heads under which civil works components relating to environmental issues can be budgeted.
- Manual on Planning & Appraisal provides details on norms and process by which environmental issues can be addressed.

The above documents are to guide program implementation at an overall level. There are also region specific or state specific environmental concerns which are being/will be addressed state wise like earthquake resistant constructions in Gujarat, Uttarakhand & the North Eastern States, construction in flood prone areas in Assam, Bihar & West Bengal, solar passive buildings in Himachal, Uttarakhand and J&K, rain water harvesting in Gujarat, Rajasthan Tamil Nadu and Karnataka. The GOI, along with the Technical Support Group would also play a pro-active role in sharing of experiences and encouraging cross learning. Good practices, both in terms of the physical environment as well as the teaching learning environment, will be shared with other states through documentation and workshops.

The monitoring and follow up from GOI with respect to environment and other infrastructure issues would be at various levels:

Appraisal of Annual Work Plans is the first step where the activities of the previous year are appraised - this also serves as a basis of the recommendations for the subsequent year.
The ‘Manual for Appraisal of Plans’, developed under SSA, clearly lays down the key issues that are looked into at this level. A reading through this Manual would indicate that most of the broad environmental concerns get addressed at this stage. E.g. with respect to physical environment, the major appraisal issues include planning of infrastructure as per a proper infrastructure survey, strategy for supervision, monitoring and implementation of civil works, strategy for ensuring quality of construction, capacity building of various stakeholders, efforts towards a child friendly and barrier free school building and strategy for repair and maintenance of school buildings. Similarly, with respect to the teaching learning environment, the appraisal looks at issues of textbooks and curriculum development, teaching learning materials and teacher training modules. These set of appraisal issues are more qualitative in nature and need an annual review to check whether states have adopted the desirable quality interventions and technically sound strategies/activities which are being advocated by SSA.

The Govt. of India is regularly supervising environmental issues by conducting quarterly meetings and receiving annual/half yearly, quarterly and monthly periodical reports from the States/UTs. The GOI use to send independent evaluation team to see the progress of environmental issues at the field level. Apart from that States are extensively supervising and monitoring the implementation of environmental mitigation issues at the State, district and sub-district level.

The SSA emphasized ownership of community on the affairs of a school and therefore Participation of Community in all Civil Works is mandatory. Village Construction Committee (VCC)/School Management Committee (SMC), Ward Management Committee (WMC) & Village Education Committee (VEC) are carrying out Civil Work activities at the school levels through transparent system of account keeping. Construction through communities is now a well established approach in SSA. The States/UT's developed community construction Manual which provides detail guidelines pertaining to mitigation of environmental issues and these guidelines are being familiarized to the community's by arranging training programme in which special emphasis is given to train community members and mason. Adequate provisions are being made in the Annual Work Plan & Budget for Training to the Community members including Masons, teachers and engineers.

Technical Support Group (TSG) is regular!} assisting Govt. of India to review the environmental issues. The States are being advised regularly to provide adequate arrangement for supervision and monitoring at State, District & Block level, in accordance with the work load. Most of the States, now have in house Engineering Cell whereas, some of them are working with line Engineering Department of the State.

For monitoring of the Program, with respect to outcomes and objectives, Monitoring Institutions have been appointed for each State. These institutions would be monitoring the program through a set of ‘monitoring indicators'. The primary monitoring indicators, which are quarterly in nature, are largely on progress of civil works and narrowing the gap between requirements and planned targets.
“Total (65) schools spread over all the 9 blocks and remote areas of the district (Table-4) were visited. The schools were in neat and clean environment; airy classrooms with proper lightning, flooring, roof and windows were found, in majority of the schools (barring a few schools which were in building provided by the JBVS) seating arrangements was on the tatpatti and some schools the bench were also made available by the JBVS or Tribal Welfare Department but in few schools JBVS had provided 'Patta' for sitting of the children or using as desk for writing and sitting on tatpatti. There were playgrounds in most of the schools but there was lack of play material for the children in the schools.”

National level monitoring would also be supplemented through the proposed Joint Review Missions. These Missions would look into all aspects of program implementation, including environmental ones (as per this Report). DPEP experience shows that these JRMs have been very effective in identifying shortcomings and highlighting good practices. In fact many of the civil works initiatives under DPEP like design renewal, use of local materials, efforts towards a child friendly school etc emanated from these interactions.

Apart from this, GoI would consider periodic third party evaluations of the physical infrastructure constructed under the program. These evaluations would be in line with the DPEP National evaluation of civil works and would look at both the 'process' and the 'product'. Aspects like school location, site selection, prioritization and planning, designs, materials and technologies, costs, quality of construction, community involvement and maintenance are going to be evaluated in more detail through this process. These evaluations will be carried out through independent consultants, academic institutes or government bodies - the logistics of the same would be decided at the state level.

While this remains the overarching safeguard strategy to mitigate environmental issues, a series of initiatives are proposed to address environmental concerns emerging from National TPE.

**National TPE: Emerging Environmental Concerns and Proposed Mitigation Measures**

1. In all States, there is a reported lack of scaled campus maps. The fifth JRM (January 2007) reported that this is leading to unplanned and haphazard expansion of schools.

   *Mitigation Measure: All States will be directed to prepare campus maps for the new schools to be taken up.*

2. Most States have allocated uniform building cost throughout the State. This is reported to pose difficulties for remote schools and difficult sites (for example hill slopes, special soil types requiring additional care for foundations). Some States have not incorporated natural hazard resistant features in design or implementation or both.

   *Mitigation Measure: All States have already been directed to develop context specific designs and prepare cost estimates according to prevalent State PWD Schedule of Rates. The States will be further directed to review adopted building designs and revise/ develop*
school designs and estimates to be context specific including incorporation of necessary hazard resistant features.

3. Ramps have been provided in all schools, however, there are concerns related to its slope or width.

*Mitigation Measure: All States will be directed to take corrective steps in improving the ramps and to strictly adhere to specifications in future construction.*

4. The JRM and TPE (National and State) reports together indicate that local materials are used in all States. However, adoption of alternate and appropriate building technology including use and further developments of DPEP school building designs is limited.

*Mitigation Measure: Use of cost-effective technologies will be emphasised through national quarterly reviews and workshops and through specific instructions to States.*

5. National TPE reports lack of maintenance and cleanliness of sanitation facilities. TPE reports insufficient provision in schools with large no of students. The reports also indicate that water potability tests are not reported from any of study schools.

*Mitigation Measure: Agreed measures are – a) All SSA schools will have water supply and separate toilets for girls by 2010; b) The MHRD will again direct all States to ensure cleanliness and maintenance of toilets; and c) The MHRD is already in constant dialogue with Department of Drinking Water and Sanitation for convergence on water supply and toilet provision in schools. The MHRD will initiate a dialogue with Department of Drinking Water Supply address concerns about lack of potability tests of drinking water in schools.*

6. Development of school campus by planting trees, flowering shrubs, medicinal plants and gardens is largely ignored across States. Campus without boundary is cited as a key reason for this.

*Mitigation Measure: Boundary provision is being undertaken in a phased manner starting with States where other infrastructure gaps are bridged. The States will be directed to promote provision of green fence (hedge etc.) through community participation. Campus development by planting trees and plants will be promoted through awareness generation and motivational programmes for VECs and teachers.*

7. JRM reports and TPE evaluation indicate urgent need for capacity building (CB) of technical staff through training, exposure visits and other inputs. Lack of technical teams’ awareness on environmental concerns and safeguard mechanisms is resulting in a number of shortfalls in safeguarding environmental concerns.

*Mitigation Measure: All States will be directed to modify engineers’ training programme to include one day schedule to orient the engineers on environmental concerns and safeguard mechanisms. All engineers will be given a compulsory training of minimum 5 days every year. (Starting 2007-08)*

8. School infrastructure Operation and Maintenance (O&M) is currently financed through annual Repair and Maintenance Grants (RMG) and other State funds. RM funds are spent
on maintenance of old buildings. Recently constructed SSA buildings are in good condition; however, the minimum required annual maintenance has not been carried out. This is resulting in an accumulation of maintenance needs of SSA buildings. National TPE observed lack of efforts on part of community to contribute towards O&M.

*Mitigation Measure: all the States have undertaken to provide adequate resources and maintain assets created under SSA. Additionally, MHRD will direct all States to develop sustainable school infrastructure O&M strategy.*

9. Monitoring and Evaluation: Adequacy of environmental safeguards is being monitored through State and National third-party evaluations, six monthly JRMs and quarterly National reviews.

*In addition, the MHRD has proposed internal environmental audits. The audits will be conducted by special team constituted out of existing lot of engineers within the State. All States and UTs will be covered in a cycle of three years. The audit expected to provide the State technical teams to learn through self-evaluation.*

This assessment therefore is based on the premise that the guidelines and manuals circulated to the states are put to effective use and the States share the vision and objectives of the programme.
ANNEX-I: SUMMARY OF NATIONAL TPE FINDINGS

The summary is based on quick reading of TPE reports from seven States\(^2\). These are initial findings and need to be confirmed with respective States.

Site Selection and Sensitivity: Most school buildings are reportedly located in existing campus, which are safer. Water-logging was reported from few schools in MP and most schools in Assam. Few schools in Assam are located near a railway line or National Highway. In J&K\(^3\), a few schools are located near a drainage course (nallah, stream or river). Donation of land, by villagers, is reported from all States. In Assam, tea estates and railways (on long term lease) have provided land for schools; these donations are reported to be unrecorded.

Site Planning and Building Designs: In all States, there is a reported lack of appropriate infrastructure data and school maps, which are essential for school planning. Preconstruction topographic surveys are not reported from any State. These findings corroborate with fifth JRM observations that lack of scaled school campus maps and adequate planning is leading to unplanned and haphazard expansion of schools.

Most States have developed multiple designs for school buildings – Additional Classroom (ACR), New Primary School (PS), New Upper Primary School (UPS), Cluster Resource Centre (CRC) and Block Resource Centre (BRC). Gujarat has developed maximum number of alternatives for ACR, new PS and new UPS. Shortage of land is reported from Bihar, few designs address this issue by constructing multi-storied buildings. The BRC building in Bihar has separate dormitories on the first floor with separate toilets for women and men. The Government of Bihar (GoB) is providing about Rs. 6.00 to Rs. 7.50 Lakh of additional resources for construction of BRC buildings.

In all study States, designs are developed at the State Project Office (SPO) and circulated to the Village Education Committee (VEC) through respective District Project Office (DPO). Most states have allocated uniform building cost throughout the State. This is reported to pose difficulties for remotely located schools. School building estimates in Bihar vary for different districts. The MHRD has instructed all States to develop context specific designs and prepare estimates based on State PWD Schedule of Rates.

The VECs, in Leh, are not happy with the building design supplied by SPO. The design having open veranda is unsuited for the region, where chilly winds blow during most of the year. Fund shortages are reported from some schools in MP. This was mainly due to uniform estimates without considering site specific requirements (e.g. soil type). In TN and Assam, adequate slope protection is reported missing in a few schools. Fund shortages have resulted in delays in works in MP. In MP, few VECs have resorted to reducing the plinth area and uneven settlement in building foundation (due to unsuitable design) is reported from a few schools.

Hazard Resistant Designs and construction: Adequate precautions for earthquakes, both in design and implementation, were observed in Gujarat and Assam. In J&K provisions are made in the designs, but there are shortfalls reported in practice. In MP and Chhattisgarh,\(^2\), Assam, Bihar, Chhattisgarh, Gujarat, Jammu and Kashmir, Madhya Pradesh and Tamil Nadu
\(^3\) In Srinagar and Budgam districts
design and implementation apparently has left out lintel and roof level ties. Protection against steep slope was not provided in schools in TN and Assam. Absence of fire fighting arrangements reported from all schools across study States.

**Learning Environment free of Barriers:** Provision of ramps is reported from most study schools. Nevertheless, there are serious concerns about the slope and width of ramps except in Gujarat and Assam schools. No other essential features, such as special play equipment or toilets (for disabled) are reported. TN has dedicated one CRC in each block for CWSN.

**Construction Process:** **Technical Support and Guidance:** Most states have engaged sufficient technical personnel. Overall quality of technical support and guidance to VECs is reported satisfactory. Technical unit of Gujarat is reported to be the best. Good support is reported from TN, Bihar, MP and Assam. Problems were reported from Chhattisgarh, where the RES engineers are given the responsibility.

**VEC Training and Consultations:** VEC training is reported from all States. Training in Gujarat, TN and Bihar covers – construction techniques, quality control and account keeping. Designs and estimates are also explained to VECs and a booklet is handed over. In MP, and Chhattisgarh only a record keeping training is reported. Initial VEC consultations are for finalising the building plan and layout. Strong VEC role in selection of plan (through use of demonstration models and / or detailed discussions) is reported from Gujarat. In most States, VECs together with Head Teacher (HT) have altered the layouts as per available plot sizes or other constraints.

In all States, VECs are responsible for material purchase and building construction. In Chhattisgarh, however, the Sarpanch and HT undertake the task. VECs purchase material at lowest price from local market. Fund flow is reported to be largely efficient. Overall building completion period is assumed to be 4 months, except in J&K, where 2 month timeframe is assumed for ACR completion. Few buildings are completed within this time-frame. Overall planning does not account for monsoon/ harvesting breaks and fund transfer delays.

VEC maintain records of material purchases, financial transactions and material stock. The technical teams also maintain Measurement Books. Typical record keeping reported from study States is presented in Table (1) below.

<table>
<thead>
<tr>
<th>Record</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cashbook</td>
<td>Gujarat Yes Tamil Nadu Yes Bihar Yes Madhya Pradesh Yes Chhattisgarh Yes Assam Yes J&amp;K Yes</td>
</tr>
<tr>
<td>Vouchers</td>
<td>Gujarat Yes Tamil Nadu Yes Bihar Yes Madhya Pradesh Yes Chhattisgarh Yes Assam Yes J&amp;K Yes</td>
</tr>
<tr>
<td>Stock Register</td>
<td>Gujarat Yes Tamil Nadu No Bihar No Madhya Pradesh Yes Chhattisgarh No Assam No J&amp;K Yes</td>
</tr>
<tr>
<td>MB</td>
<td>Gujarat Yes Tamil Nadu No Bihar No Madhya Pradesh Yes Chhattisgarh No Assam No J&amp;K Yes</td>
</tr>
</tbody>
</table>

VECs in Gujarat and MP were reported to maintain all records. VECs in remaining states, however did not maintain stock register.
**Construction Quality:** Overall building construction quality is good. However, development of cracks is reported in a few buildings in Chhattisgarh and MP. A case of uneven foundation settlement is reported from Madhya Pradesh. Non-provision of plinth protection is reported from most study schools across all States.

**Use of Cost Effective Technologies and Local Material:** Use of cost-effective technologies in school building construction is reported in pre 2004-05 buildings in Bihar. As of now, none of the study States are reported to use cost-effective technologies. The JRM and TPE reports indicate widespread use of local material in all States.

**Rainwater Harvesting Techniques:** Rainwater harvesting (RWH) systems are installed in all schools in Gujarat and few schools in TN. In other States, the system is not installed. Maintenance of RWH systems is lacking in TN. Good maintenance reported from Gujarat schools. In Gujarat collected water is used for washing mid-day meal utensils and toilet flushing. In all other States, the VECs, teachers and Engineers are reported to be unaware of these systems.

**Energy Efficient Buildings:** Energy efficient building designs are reported only from schools built in Leh district of J&K. In all other States, VECs, teachers and technical staff are reportedly ignorant.

**Teaching Learning Environment:** Development of school campus by planting trees, flowering shrubs, medicinal plants and gardens is largely ignored across States. Campus without boundary is cited as a key reason for this. Nevertheless, in few rural schools old trees are maintained. Few examples of teachers’ initiative are also reported. Urban schools in Gujarat are reported to have good gardens. BaLA (Building as Learning Aid) and other innovative concepts (that aid in activity based learning) are being implemented in Gujarat. J&K has also started implementing these innovations.

**Facilities: Water, Sanitation, Kitchen Sheds, Boundary and Electricity**

**Water Supply:** Availability of water supply is reported from all sample schools across study States. Hand-pump is reported to be most common water source in rural schools. In urban schools, Piped Water Supply (PWS) is commonly observed. There are issues reported with maintenance of water tanks (in Gujarat and J&K) and hand-pumps (MP, Chhattisgarh and Assam). Hand-pump theft is reported from Bihar. Water quality tests are not reported from any State.

**Sanitation:** Availability of toilets is reported from all schools except in J&K, wherein toilet availability is reported from some schools. Non-availability of water in toilets is reported from all States. Also, there are issues reported with location of soak pits and septic tanks. Less than adequate provision in schools having a large number of students is reported. There are problems reported with maintenance of the facilities and privacy of girls.

**Kitchen Shed:** Permanent kitchen sheds are reported from most schools in Tamil Nadu and Gujarat and few schools in Assam. In other schools, food is reportedly cooked in abandoned classrooms or in the open. In few villages in Chhattisgarh, food is cooked in nearby houses. Schools also face problem in storage of food grains and firewood.
Boundary Walls: Most rural schools do not have a boundary wall. On the contrary all urban schools have a boundary wall. Gujarat has arranged classrooms in such a way that the effective boundary wall length is reduced. Lack of a boundary wall is reported as a key reason for not having trees, plants and gardens.

Electricity: Provision of electrical fixtures in classrooms is reported from most schools in TN and urban schools in and all States. Funds for electrical fixtures are provided by PTAs, villagers or the Sarpanch (Gram Panchayat Head). Energy charges are however paid by school teachers.

Operation and Maintenance: Prior to SSA implementation, study schools across States, lacked building maintenance. The Head Teachers did not receive any maintenance grants. With the launch of SSA, the VECs are receiving Repair Maintenance (RM) grants. These funds are mostly spent on maintenance of old buildings. In few schools, energy charges are also paid from these funds. Though the funds are not sufficient (in some schools), it has helped maintain the existing infrastructure.

Recently constructed SSA buildings are in good condition. However, the minimum required annual maintenance has not been carried out. This is resulting in an accumulation of maintenance needs of SSA buildings. Cracks are already reported in some schools in MP and Chhattisgarh.

As the maintenance of new buildings become inevitable, most schools will face a fund shortage. There are no efforts on part of community to contribute towards operation and maintenance.

Programme Highlights: Key highlights of the programme are:

- Programme success attributed to community participation;
- Schools with dilapidated infrastructure have been generally taken on priority. Overall building construction quality is good. Praiseworthy improvements in overall school infrastructure.
- BRC buildings in many States are good training centres equipped with projector, audio-visual aids. The design of BRC in Bihar is excellent with separate dormitories for women and men. GoB contributes additional funds for BRC construction. In Tamil Nadu, one CRCC in each block is used as a day-care centre for CWSN. In Gujarat some schools have special rooms for activity based learning for small children
- BaLA is being implemented to aid in activity based learning in MP and Gujarat
- Technical manpower is largely sufficient in most States. Nevertheless, there are issues with training of technical staff, and support and guidance to VECs in few States – Chhattisgarh
- Villagers have donated land, furniture, electrical fixtures. Land donations are also reported from Indian Railway and private tea estates. However, these contributions remain unrecorded.
- The programme has reached ‘difficult to reach’ locations
- Earthquake protection features built in school buildings constructed in Gujarat, Assam and J&K
- Multi-storey building to overcome land problems
Emerging Concerns: The emerging concerns based on field observations are:

- In all States, there is a reported lack of scaled campus maps. The fifth JRM (January 2007) reported that this is leading to unplanned and haphazard expansion of schools.
- Most States have allocated uniform building cost throughout the State. This is reported to pose difficulties for remote schools, difficult sites (e.g. hill slopes, special soil types requiring additional care for foundations). Some States have not incorporated natural hazard resistant features in design or implementation or both.
- Ramps have been provided in all schools, however, there are concerns related to its slope or width. The TPE did not review other barrier free features incorporated in designs and implementation.
- The JRM and TPE (National and State) reports together indicate that local materials are used in all States. However, adoption of alternate and appropriate building technology including use and further developments of DPEP school building designs is limited.
- DISE reports indicate lack of water supply and toilets availability in 17 percent and 48 percent schools respectively. Separate girls’ toilets are not available in 63 percent schools. National TPE reports lack of maintenance and cleanliness of sanitation facilities. TPE reports also indicate that water potability tests are not reported from any of study schools.
- No permanent kitchen sheds in most States – food cooked in open or old classroom, lack of storage for food grains
- Development of school campus by planting trees, flowering shrubs, medicinal plants and gardens is largely ignored across States. Campus without boundary is cited as a key reason for this.
- JRM reports and TPE evaluation indicate urgent need for capacity building (CB) of technical staff through training, exposure visits and other inputs. Lack of technical teams’ awareness on environmental concerns and safeguard mechanisms is resulting in a number of shortfalls in safeguarding environmental concerns.
- School infrastructure Operation and Maintenance (O&M) is currently financed through annual Repair and Maintenance Grants (RMG) and other State funds. RM funds are spent on maintenance of old buildings. Recently constructed SSA buildings are in good condition; however, the minimum required annual maintenance has not been carried out. This is resulting in an accumulation of maintenance needs of SSA buildings. National TPE observed lack of efforts on part of community to contribute towards O&M.